



## Views You Can Use

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As you will see under the “Education Trends” section, students in the United States have improved in math and science over the past decade, according to the latest Trends in International Mathematics and Science Study (TIMSS). Still, our education system has some catching up to do compared to countries such as Hong Kong, Singapore, Taiwan, and Japan. Schools that have reformed their curricula to meet the global education standard will be presenting at our Winter Symposium, Improving K-12 Student Performance — From Successful Practices to Action Plans on January 23-25 in Washington, D.C. We hope to see you there. For more information, please visit [www.leadered.com/09symposium.html](http://www.leadered.com/09symposium.html)

Sincerely,  
Bill Daggett

## Education Trends

### U.S. Students Improve in Math and Science, but Still Lag Behind Internationally

U.S. students in 4<sup>th</sup> and 8<sup>th</sup> grades have improved their scores in math in the past decade, but still lag behind students in Asia and Europe, according to the 2007 Trends in International Mathematics and Science Study (TIMSS) released this month. U.S. students’ science scores, on the other hand, remained flat. The results from the world’s largest review of math and science achievement included 4<sup>th</sup> grade scores from 36 countries and 8<sup>th</sup> grade scores from 48 countries. Topics covered included algebra, chemistry, geometry and physics. The TIMSS test was last administered in 2003.

Students in 4<sup>th</sup> grade in Hong Kong and 8<sup>th</sup> grade students in Taiwan earned the top scores in math. Singapore dominated in science at both grade levels. Most of the math improvement in the United States took place among the lowest performing students, which some analysts say is the result of an increased focus on struggling learners. (See “By the Numbers” for more statistics.)

Sources: [www.nytimes.com/2008/12/10/education/10math.html?\\_r=2&ref=education](http://www.nytimes.com/2008/12/10/education/10math.html?_r=2&ref=education)  
[www.csmonitor.com/2008/1210/p03s05-usgn.html](http://www.csmonitor.com/2008/1210/p03s05-usgn.html)

### Reading First Fails to Improve Test Scores

Reading First, the \$6 billion federal reading program at the heart of *No Child Left Behind*, is not helping students score any better on reading tests, according to a study released earlier this year by the Department of Education. Teachers in Reading First classrooms spend about 10 minutes more each day on instruction in the five areas emphasized by the program (awareness of individual sounds, phonics, vocabulary, reading fluency, and comprehension) than teachers in schools that don’t receive program grants, the study concluded. There was no difference

when children were tested on how well they could read and understand material on a widely used exam.

While some educators still laud the program, critics say that Reading First places too much emphasis on phonics instruction and not enough on reading comprehension. The congressionally mandated study focused on tens of thousands of students in 248 schools in grades 1-3 in 13 states. The students were tested and researchers observed teachers in 1,400 classrooms. About 1.5 million children in 5,200 schools participate in Reading First.

Source: [www.washingtonpost.com/wpdyn/content/article/2008/05/01/AR2008050101399\\_pf.html](http://www.washingtonpost.com/wpdyn/content/article/2008/05/01/AR2008050101399_pf.html)

*The International Center believes that reading proficiency is the key enabler of learning. We offer a number of reading resources, including Strategic Reading in the Content Areas — Boosting Achievement in Grades 7-12 and Reading Strategies for Career Academies and Career-Technical Education. For more information, please visit <http://store.leadered.com>.*

## **Technology Trends**

### **More Access to Digital Text — But for a Price**

Google has agreed to a settlement with book publishers and authors that allows both sides to profit more easily from digitized text. Over the last several years, Google has been in negotiations over U.S. lawsuits around copyright issues, particularly relating to Google's Book Search initiative, in which the Internet company has worked with libraries and universities since 2004 to scan millions of books and other works, regardless of the copyright status, and make them accessible online. Under the agreement, Google will pay \$125 million, which in part will help create the Book Rights Registry, an independent not-for-profit organization that will collect and disburse Google revenue to authors, publishers, and other rights-holders.

The settlement, pending court approval, would allow Google to go forward in expanding online access to millions of copyrighted materials. Google will show up to 20% of the text at no charge to users and make an entire publication available online for a fee, of which copyright holders will receive a percentage. The agreement is considered a significant development in the future distribution of digital works of authors and publishers, who do not want to suffer the same fate as the music industry, which still has not recovered from the digital world of nearly unlimited access to free music.

Sources: [http://stephenslighthouse.sirsidynix.com/archives/2008/10/major\\_google\\_bo.html](http://stephenslighthouse.sirsidynix.com/archives/2008/10/major_google_bo.html)  
[www.marketwatch.com](http://www.marketwatch.com), [www.nytimes.com/2008/10/29/technology/internet/29google.html](http://www.nytimes.com/2008/10/29/technology/internet/29google.html)

### **Good Vibrations = More Sophisticated Cameras**

New miniature image-capturing technology powered by water, sound, and surface tension could lead to smarter and lighter cameras in everything from cell phones and automobiles to autonomous robots and miniature spy planes. Researchers at Rensselaer Polytechnic Institute have designed and tested an adaptive liquid lens that captures 250 pictures per second and requires less energy to operate than competing technologies. The lens is made up of a pair of water droplets that vibrate back and forth upon exposure to a high-frequency sound, and in turn, change the focus of the lens. By using imaging software to capture in-focus frames automatically and discard any out-of-focus frames, the researchers can create streaming images from low-cost high-fidelity miniature cameras.

Source: <http://news.rpi.edu/update.do?artcenterkey=2494>

## **Biotechnology Trends**

### **Fighting Tooth Decay — With Candy**

Most of us connect candy with tooth decay, but children in Venezuela who ate a special cavity-fighting candy had 62% fewer cavities than those who brushed their teeth regularly, according to researchers at the Central University of Venezuela and Stony Brook University School of Dental Medicine. BasicMints is an experimental fluoride-free treatment designed to mimic a component in human saliva that neutralizes enamel-eroding acids in the mouth. Stony Brook University researchers, who developed the active compound in the mints, known as CaviStat, tested the candy in 200 children in aged 10-11 for the one-year study. The soft mints are designed to be dissolved and chewed into the biting surfaces of the back teeth, where about 90 percent of cavities in children's teeth occur. Ortek Therapeutics, a privately held company in Roslyn Heights, N.Y., has licensed the technology.

Sources: [www.enn.com/top\\_stories/article/34354](http://www.enn.com/top_stories/article/34354)

## **Nanotechnology Trends**

### **Better Storage for Renewable Energy**

University of Texas at Austin researchers have used one-atom-thick “graphene sheets,” a carbon-based material, to increase the storage capacity of ultracapacitors, paving the way for energy storage devices that could supersede batteries in hybrid cars and change the entire energy grid structure.

Ultracapacitors are devices that can be used in a wide range of energy capture and storage applications, either by themselves as the primary power source or in combination with batteries or fuel cells. Some advantages of ultracapacitors over more traditional energy storage devices (such as batteries) include higher power capability, longer life, a wider thermal operating range, lighter and more flexible packaging, and lower maintenance. Ultracapacitors have a storage capacity thousands of times greater than conventional capacitors, but they need to be improved to rival battery storage. The researchers say that the graphene sheets could double the capacity of existing ultracapacitors, which are manufactured using a different form of carbon.

The U.S. Department of Energy has said that an improved method for storing electrical energy is needed for the substantial installation of renewable energies such as wind and solar power. Storage is vital for times when the wind doesn't blow or the sun doesn't shine. During those times, the stored electrical energy can be delivered through the electrical grid as needed.

Source: [www.utexas.edu/news/2008/09/16/carbon\\_energy](http://www.utexas.edu/news/2008/09/16/carbon_energy)

## **By the Numbers**

Following are additional 2007 TIMSS statistics that compare how U.S. students fared overall in math and science on the international stage. (See “Education Trends” for full story.)

- In math, the average score among 4<sup>th</sup> graders rose 11 points since 1995, when the first TIMSS scores were released. Still, the students were outpaced by their peers in Hong Kong, Singapore, Taiwan, Japan, Russia, and England.
- For U.S. 8<sup>th</sup> graders, the average mathematics score was lower than those in five countries: Taiwan, Korea, Singapore, Hong Kong, and Japan.
- In math, 4<sup>th</sup> graders in seven Asian and European countries outperformed their American peers on overall scores (Singapore, Hong Kong, Taiwan, Japan, Kazakhstan, England, and Russia).
- In science, 4<sup>th</sup> graders in the United States scored 549, well above the international average of 500, but below several Asian nations: Singapore, Taiwan, Hong Kong, and Japan. Eighth graders scored 520, similarly above average, but below Singapore, Taiwan, Japan, England, Korea, and Hungary.
- In Massachusetts, students did as well in science as some of their Asian peers. Students in 4<sup>th</sup> grade came in second internationally behind Singapore and ahead of Taiwan, Hong Kong, and Japan. By contrast, the United States as a whole placed 11<sup>th</sup>.\*

\*The TIMSS exam is administered nationally but individual regions, such as states and territories, can take it separately.

Sources: <http://nces.ed.gov/timss/results07.asp>  
[www.boston.com/news/education/k\\_12/articles/2008/12/10/bright\\_sign\\_for\\_tech\\_in\\_mass/](http://www.boston.com/news/education/k_12/articles/2008/12/10/bright_sign_for_tech_in_mass/)